

ORIGINAL ARTICLE

Online lectures for students in dermatology: A replacement for traditional teaching or a valuable addition?

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Abstract

Introduction/Objective Although the Internet, podcasts and multimedia have become a natural part of our life, these instruments still do not find widespread use in medical education. We aimed to increase the percentage of students benefiting from our lectures during their 6-month principal training period in dermatology by making lectures available online.

Methods To establish a baseline, we started to count and calculate the average percentage of students attending face to face classes. For the next semester, with a new student generation, we made recordings of about half of the lectures and made them available online. After this testing period, we informed the next new student population at the beginning of the following semester that all lectures would be recorded and made available online. Students' attendance was documented during these periods, and in addition, questionnaires were used to assess students' acceptance and use of the online lectures.

Results At the end of the project, 66% of the students ($n = 256$) indicated that they had used the online lectures, and 12% of all students stated that they were usually unable to attend lectures due to conflicting obligations, but could now participate thanks to the e-learning programme. An additional 44.9% of all respondents indicated that they welcomed the e-learning programme as a way to view specific lectures. The average attendance of face-to-face lectures did not decrease.

Conclusion Online lectures in dermatology were highly welcomed by our students and may be a good means to improve the education of students in dermatology.

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Keywords

dermatology, e-learning, evaluation, medical education, online lectures, students

Conflicts of interest

None declared.

Introduction

Multimedia has become omnipresent in our world over the last decade and words such as podcast, MP3 and the iPhone are rapidly becoming a normal part of our every day language. In the traditional medical education at the university level, however, there is still surprisingly little use of these new tools to facilitate learning for dermatological students, although dermatology as a visual discipline seems particularly well suited for the use of e-learning. The e-learning project DEJAVU has been integrated into the curriculum at the Department of Dermatology at Charité-Universitätsmedizin Berlin since 2002. Traditionally, DEJAVU

offered lecture hand outs, structured learning modules, and case reports as well as online information accompanying the traditional face to face lectures.¹ Participation has always been on a voluntary base, and the program is open to all students after a simple registration procedure.

In addition to the existing e-learning program, we started in the summer semester 2006 to produce audio recordings of the lectures given at the Department of Dermatology and made them available, together with accompanying PowerPoint slides, as streaming online content to all dermatology students. Lectures are mandatory for all medical students in Germany, but attendance

policies are traditionally not enforced, which can lead to low turnout. In addition, at Charité Universitätsmedizin in Berlin, dermatology lectures – the focus of this study – begin as early as 7:30 a.m., which makes regular attendance even more challenging for some students. Most of the lectures are given by the head of the department Prof Sterry, who, in case of other obligations, is replaced by another member of the faculty. The principal period of student training in dermatology consists of a 6-month lecture twice a week for 45 min each. Since the teaching locations are widespread throughout the city, students often have to commute from one lecture hall to another within 1 day. Having recordings of the face-to-face lectures available online and on-demand would provide students with greater flexibility. However, we found that some of our fellow teaching physicians were sceptical about the idea primarily because of concerns that students would no longer attend the live sessions.

The aim of this study was to evaluate student's acceptance and use of online lectures as well as their impact on students' attendance. We hypothesized that (a) the total number of students benefiting from the lectures would increase, and (b) attendance levels of traditional lectures would remain stable rather than decrease. Our results are meant to encourage other dermatology departments to use e-learning for student education and to help to overcome barriers towards online transmission of lectures.

Our study was part of the e-learning initiatives DEJAVU (Dermatological Education as a Joint Venture of Virtual Universities) and ELWIS MED (E-Learning Wissensvermittlung in der Medizin) and was funded by the German Ministry of Research. We performed an extensive search for existing online lectures at dermatological faculties in Germany at the beginning of our project in 2006. We checked the homepages of all dermatological clinics involved in undergraduate medical education for the mentioning of an e-learning program. If a mentioning of such a program was found, we contacted the colleagues and asked for an access to their program and for additional details with regard to the existence of online lectures. We found that a comparable online archive of lectures did not exist at any other German medical school.

However, another existing valuable online source that does not offer online lectures but provides a large number of other useful teaching materials is available under <http://www.swissdom.org>, a joined e-learning program of multiple universities lead by the University of Zurich.²

Methods

Technical requirements

We chose a PowerPoint-based software package (Microsoft Producer for PowerPoint) to edit audio recordings of the lectures and combine them with PowerPoint slides. The resulting webcasts were then uploaded onto the open-source Moodle learning management system hosted by the Humboldt-Universität zu

Berlin, with which Charité is affiliated. As a result, an identical online version of the face-to-face lectures was available online. For optimal function, students needed a high-speed Internet connection. A student survey conducted during winter semester 2005/2006 (i.e. at the beginning of the project) showed that 59% of second-year medical students possessed a high-speed connection, a number that is likely to have increased over time.

Developing the online archive and monitoring student attendance at face-to-face lectures

There were three consecutive observation periods, each extending over one semester with a new student population pursuing their principal training in dermatology. Each semester, a total of 26 lectures of 45-min duration were given. The lectures covered the standard repertoire of subjects in dermatology, venereology, and allergy and were not modified substantially in terms of presentation or content during the study. Time and location of the traditional lectures remained unchanged throughout the three semesters. As part of an in-phase approach, the first semester was used to assess a baseline attendance rate of the traditional lectures without any lectures available online.

Over the course of the second semester, audio from approximately 50% of the lectures was recorded and made available online, together with the accompanying PowerPoint slides, to all registered dermatology students. The second semester was designed as a test run to eliminate technical difficulties, to familiarize students with the new online programme and to further evaluate the practicability of the learning management system in a medical school context.

Finally, at the beginning of the third semester – again with a new student generation – all dermatology students were informed about the online archive, the recordings of lectures from the previous semester were made available online, and all of the remaining lectures were recorded and placed on the online platform as they became available. Student attendance was recorded throughout the observation period, and students' attitudes towards the online lectures were evaluated at the end of the second and third semesters using questionnaires.

Results

Assessment of students' acceptance of online lectures

Dermatology students' acceptance of our e-learning programme was assessed at the end of winter semester 2006/2007 using a questionnaire distributed during final exams. A total of 297 of the 325 registered students participated in the final exam, and 256 students filled in the questionnaire.

Out of all respondents, 66% ($n = 169$) indicated that they had used the online lectures, and 12.1% (31) stated that they were usually unable to attend lectures due to conflicting obligations, but could now participate thanks to the e-learning programme. A total of 44.9% ($n = 115$) of respondents indicated that they

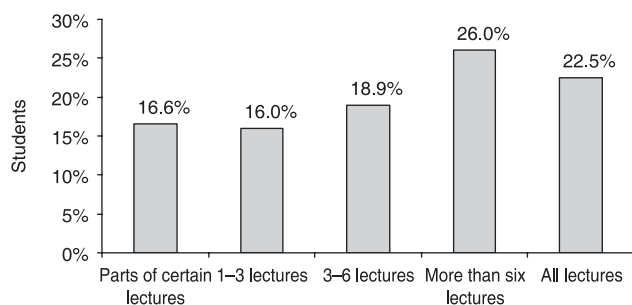


Figure 1 Number of online lectures viewed by the students (winter semester 2006/2007; $n = 169$).

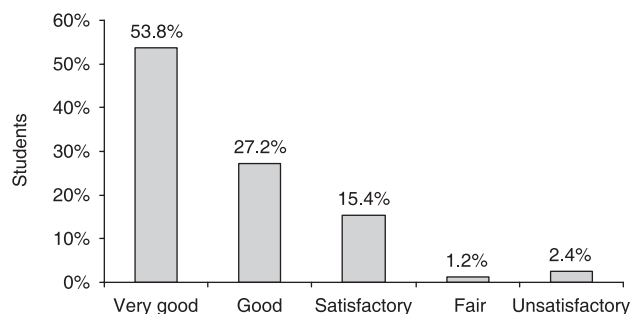


Figure 2 Usefulness of the e-learning programme for training in dermatology as assessed by students (winter semester 2006/2007; $n = 169$).

welcomed the e-learning programme as a way to view specific lectures they had missed or as a means of preparing for exams.

Of the students who used the e-learning programme, a full 22.3% ($n = 57$) indicated that they had viewed all 26 lecture webcasts, and 26.2% ($n = 67$) indicated that they had viewed more than 6 lecture webcasts (Fig. 1). Within the group of those students stating that they were usually unable to attend lectures due to conflicting obligations, an even greater percentage (52%) of the students viewed all the webcasts. In general, the online lectures were highly appreciated by our students, more than 80% of whom reported that the e-learning programme had had a good or very good impact on their training in dermatology (Fig. 2).

In total, 14.8% ($n = 38$) of all respondents reported that they had not been able to take advantage of the e-learning programme due to technical difficulties, but that they were nevertheless interested in doing so. Only 5.9% ($n = 15$) of respondents indicated that they felt e-learning, in general, was not useful.

Assessment of student attendance

During the first semester of our study (winter semester 2005/2006), online lectures were not yet available. The average number

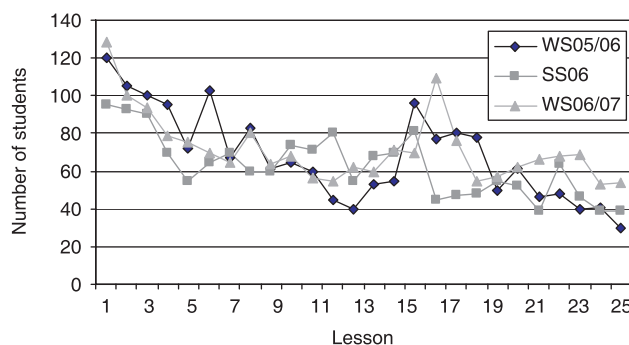


Figure 3 Number of students attending face-to-face lectures over the course of the semester. WS, winter semester; SS, summer semester.

of students attending each face-to-face lecture during this semester was 68 out of 374 students, which represented 18% of all students signed up for the lectures at the time. During the second semester of our study (summer semester 2006), at the beginning of which students had been informed that some lessons would be made available online, the average number of students attending each face-to-face lecture was 62 out of 322 (19%). Finally, in the third semester (winter semester 2006/2007), during which all of the dermatology lectures were made available online, the average number of students attending each course was 72 out of 325, or 21%. Thus, the percentage of students attending face-to-face sessions did not decrease, but rather showed a slight increase (Fig. 3).

Discussion

The online transmission of lectures was highly welcomed by our dermatology students

By augmenting our traditional course offerings, we were able to make lectures available to an additional 12% of students, who otherwise would have missed the lectures entirely. In addition, many of the students with irregular attendance indicated that they welcomed the e-learning programme as a valuable adjunct to face-to-face lectures, because it allowed them to review specific topics prior to exams or to benefit from lectures they had missed. Our findings show that making lectures available online to dermatology students did not lead to a decrease in the percentage of those attending face-to-face lectures, but rather to a slight increase.

The average attendance at our traditional lectures during the observation period was only 21%, which may be low by international standards, but is not at all uncommon for lectures in Germany. Above all, this participation rate shows that there is a need to address organizational and structural barriers at our university, including scheduling conflicts and long commutes. Doing so,

however, would go beyond the scope of this paper, whose aim was to assess whether an e-learning programme might expand the reach of traditional lectures. The quality of the dermatology lectures themselves, has been confirmed several times; indeed, they have been rated by the students as being among the best course offerings in the training programme.

The original fears that online lectures might lead to a substantial reduction in student attendance were unfounded. The fact that no decrease in attendance was observed indicates that the face-to-face format of the lecture hall remains students' preferred way to learn, presumably because it provides students with the opportunity to ask questions and interact with the lecturer and fellow students. In addition to this 'face-to-face lecture type student', there seems to be a group of 12% of the students that would not have benefited from the lectures if it had not been available online. Most of the students used the online lectures in addition to the traditional lectures and as a means to prepare for exams. In general, the necessity to pass a written exam in dermatology with questions referring to the contents of the lectures may have given students additional motivation to either attend face-to-face lectures or to use the online lectures. Some students may have feared technical difficulties that might hinder them from using the online lectures and therefore may have preferred the face-to-face lectures.

A preference for face-to-face teaching over online education was also described by Freeman *et al.* who observed high drop-out rates for an online drug information course that was offered as an alternative to a traditional lecture.³ Hahne *et al.* showed a decrease in students' acceptance of online content over time during the introduction of a computer-based learning programme at the University of Cologne, although this may have been due to the programme's poor quality.⁴ It therefore seems reasonable to assume that online approaches can only succeed if there are sufficient resources to develop high-quality e-learning materials. The results of a questionnaire survey among first year dental students at the University of Michigan, where lectures were made available as podcasts, showed that 90% of the students used the online lectures as an addition to the face-to-face lectures and only 9% of the students used the podcasts as a total replacement for traditional lectures. Most students welcomed the podcasts as a way to prepare for exams.⁵

Other e-learning programs in the field of dermatology have mostly focused on providing additional teaching materials online. Wahlgren *et al.* at the Karolinska Institute have offered an additional case simulation system, which focused on the training of the clinical reasoning process. The program was well accepted among the students.⁶ Jenkins *et al.* have developed a computer based tutorial to train morphologic terminology, showing that it yielded comparable results with traditional training.⁷

Value of e-learning and its future role

The precise value of e-learning remains a subject of debate. Do students benefit more from attending face-to-face lectures, and

are online courses potentially less effective? Or can an e-learning programme yield better results than traditional teaching?

The results of a small trial including 26 students conducted by Smolle *et al.* at the Department of Dermatology at the University of Graz, Austria showed greater efficacy for computerized learning than for traditional teaching methods.⁸ The course developed by Smolle *et al.* also led to high student satisfaction. The efficacy of teaching is certainly more closely associated with the quality of the content of the programme than with the means used to convey information. Online teaching, however, allows for more innovative teaching methods, as was seen in the Medumobile online project, during which medical students were able to participate online in emergency room teaching sessions.⁹ Any technical instabilities dramatically reduce students' acceptance of e-learning programs.

Due to the large number of highly subjective parameters involved, the question of whether e-learning truly leads to better results seems very difficult to answer. In the end, it may be more useful to take other factors into account, such as convenience and practicability for students and instructors. Especially considering the rapid evolution of medical knowledge, the importance of the Internet as a vehicle for delivering up-to-date content is sure to grow. Indeed, familiarizing students early with this approach to learning may help encourage their active participation in future CME.¹⁰

In summary, making lectures available online and on-demand was highly welcomed by our students and has had a positive impact on the total number of students benefiting from the lectures. This indicates that the students did not view e-learning as a replacement for traditional teaching methods, but rather as a valuable addition.

Based on these findings, we want to encourage more dermatology departments to allocate time and resources to the development of e-learning programs to further improve the quality training of medical students in dermatology. With respect to the large amount of resources and time necessary to develop such e-learning programs, the path of joint projects between multiple universities should be further pursued.

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